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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR        | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/730,230   | 12/08/2003  | Bishnu P. Gogoi             | SC12116ZP           | 2513             |
| 23125 7590 01/05/2009<br>FREESCALE SEMICONDUCTOR, INC.<br>LAW DEPARTMENT<br>7700 WEST PARKER LANE MD:TX32/PL02<br>AUSTIN, TX 78729 |             |                             |                     |                  |
| EXAMINER<br>ESTRADA, MICHELLE  |             |                             |                     |                  |
| ART UNIT<br>2823   |             | PAPER NUMBER                |                     |                  |
| NOTIFICATION DATE<br>01/05/2009  |             | DELIVERY MODE<br>ELECTRONIC |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USADOCKETING@FREESCALE.COM

### Office Action Summary

**Application No.**

10/730,230

**Applicant(s)**

GOGOI ET AL.

**Examiner**

Michelle Estrada

**Art Unit**

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 5-12, 14, 15, 17 and 19-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23 and 24 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-11, 14, 15, 17, 19-22 and 25 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

After further search the allowability of claims 4-9, 12, 16, 17, 21 and 22 is withdrawn in view of the rejection below.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-9, 11, 14, 15, 17 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao (2002/0016058) in view of Su et al. (5,869,406).
3. Re claim 1, Zhao discloses providing a semiconductor substrate (1010); forming a layer (1080/1190) over the semiconductor substrate, wherein a gap (1130/1140) is formed between the semiconductor substrate and the layer (Fig. 5); forming an opening (1150/1160) within the layer (Fig. 6); forming an insulating layer (1100) over the layer at to seal the opening and close the gap off to the environment.
4. Zhao does not disclose wherein forming the insulating layer comprises depositing the insulating layer and annealing the insulating layer.
5. Su et al. discloses wherein forming the insulating layer comprises depositing the insulating layer and annealing the insulating layer (Col. 5, lines 9-12).
6. It would have been within the scope of one of ordinary skill in the art to combine the teachings of Zhao and Su et al. to enable the insulating layer formation step of Zhao

to be performed according to the teachings of Su et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed insulating layer formation step of Zhao and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, It would have been within the scope of one of ordinary skill in the art to anneal the dielectric layer in order to densify it and to seal the underlying integrated circuit elements (Col. 5, lines 9-12 of Su et al.)

7. The combination of Zhao and Su et al. does not disclose wherein the insulating layer is formed at approximately atmospheric pressure.
8. One of ordinary skill in the art would have been led to the recited pressure to achieve a desired structure of the layer.

In addition, the selection of pressure, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily

within skill or art) and *In re Aller*, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed pressure or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen pressure or upon another variable recited in a claim, the Applicant must show that the chosen pressure are critical. *In re Woodruf*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Applicant needs to demonstrate that this is critical to the invention compare to what is already well known in the art and optimizable variables.

Re claim 2, Zhao discloses wherein the insulating layer is deposited, therefore the combination with optimization would led to an insulating layer deposited approximately at atmospheric pressure.

Re claim 3, the examiner takes official notice that the depositing an insulating layer by CVD is well known in the art at the time of Applicant's invention. Therefore, it would have been obvious to use the known method for its own disclosed purpose in the process of Zhao.

Re claims 5-9, The Examiner takes official notice that all of the annealing processes recited in these claims are well known in the art. It would have been obvious to one of ordinary skill in the art to use any of the known annealing process to anneal and densify the insulating layer.

Re claim 11, Zhao discloses wherein forming an insulating layer comprises forming a silicate glass.

Re claim 14, Zhao discloses providing a semiconductor substrate (1010); forming a sacrificial layer (1030/1040) over the semiconductor substrate; forming a layer (1090) over the sacrificial layer; etching the layer to expose a portion of the sacrificial layer (Fig. 5); removing the sacrificial layer to form a gap (1130/1140); forming an opening within the layer; forming a material (1100) over the opening; and sealing the opening with the material (Fig. 7).

9. Zhao does not disclose wherein forming the insulating layer comprises depositing the insulating layer and annealing the insulating layer.

10. Su et al. discloses wherein forming the insulating layer comprises depositing the insulating layer and annealing the insulating layer (Col. 5, lines 9-12).

11. It would have been within the scope of one of ordinary skill in the art to combine the teachings of Zhao and Su et al. to enable the insulating layer formation step of Zhao to be performed according to the teachings of Su et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed insulating layer formation step of Zhao and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, it would have been within the scope of one of ordinary skill in the art to anneal the dielectric layer in order to densify it and to seal the underlying integrated circuit elements (Col. 5, lines 9-12 of Su et al.)

12. The combination of Zhao and Su et al. does not disclose wherein the insulating layer is formed at approximately atmospheric pressure.

13. One of ordinary skill in the art would have been led to the recited pressure to achieve a desired structure of the layer.

In addition, the selection of pressure, its obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed pressure or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen pressure or upon another variable recited in a claim, the Applicant must show that the chosen pressure are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Applicant needs to demonstrate that this is critical to the invention compare to what is already well known in the art and optimizable variables.

Re claim 15, Zhao discloses wherein forming the material and sealing the opening are performed simultaneously.

Re claim 17, Su et al. disclose wherein sealing the opening comprises annealing the material (Col. 5, lines 9-12).

Re claim 19, Zhao discloses wherein forming the material comprises forming an insulating material.

Re claim 20, Zhao discloses wherein forming an insulating layer comprises forming a silicate glass.

Re claims 21 and 22, The Examiner takes official notice that all of the annealing processes recited in these claims are well known in the art. It would have been obvious to one of ordinary skill in the art to use any of the known annealing process to anneal and densify the insulating layer.

14. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao in view of Su et al. as applied to claims 1-3, 5-9, 11, 14, 15, 17 and 19-22 above, and further in view of Ikushima et al. (2007/0298534).

15. The combination of Zhao and Su et al. does not disclose wherein forming the layer over the semiconductor substrate comprises forming a polysilicon layer.



16. Ikushima et al. disclose wherein forming the layer (16) over the semiconductor substrate comprises forming a polysilicon layer.

17. It would have been within the scope of one of ordinary skill in the art to combine the teachings of Zhao, Su et al. and Ikushima et al. to enable the layer material of Zhao to be the same according to the teachings of Ikushima et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable materials for the disclosed layer of Zhao and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

18. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao in view of Su et al. as applied to claims 1-3, 5-9, 11, 14, 15, 17 and 19-22 above, and further in view of Fortin et al. (2007/0138584).

19. The combination of Zhao and Su et al. does not disclose wherein forming the layer over the semiconductor substrate comprises forming a conductive layer.

20. Fortin et al. disclose wherein forming the layer (510) over the semiconductor substrate comprises forming a conductive layer.

21. It would have been within the scope of one of ordinary skill in the art to combine the teachings of Zhao, Su et al. and Fortin et al. to enable the layer material of Zhao to be the same according to the teachings of Fortin et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable materials for the

disclosed layer of Zhao and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

### ***Allowable Subject Matter***

Claims 23 and 24 are allowed.

Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michelle Estrada/  
Primary Examiner, Art Unit 2823

ME  
December 28, 2008